

1                   **BALL CHAIR WITH A RETAINING DEVICE**

2                   This is a Continuation In Part application of US Application No.

3                   10/453,625

4                   **BACKGROUND OF THE INVENTION**

5                   1. Field of the Invention

6                   The present invention relates to a ball chair, and more particularly to  
7                   a ball chair having a retaining device to hold a spherical cushion on a seat in  
8                   position to enhance the safety of the ball chair.

9                   2. Description of Related Art

10                  A conventional ball chair is composed of a chair and a spherical  
11                  cushion. The chair has a seat frame with a top face and a partly-spherical  
12                  passage defined in the top face of the seat frame to receive a lower portion of  
13                  the spherical cushion inside. By placing the spherical cushion in the partly-  
14                  spherical passage of the chair, a ball chair is achieved. However, when a user  
15                  sits on the ball chair, the spherical cushion is deformed forward and falls out  
16                  of the partly-spherical passage such that the user easily falls from the ball  
17                  chair. Additionally, when the ball chair is bumped or vibrated, the spherical  
18                  cushion rebounds and easily springs out of the partly-spherical passage.  
19                  Therefore, the ball chair is neither safe nor stable for the user.

20                  The present invention has arisen to mitigate or obviate the  
21                  disadvantages of the conventional ball chair.

22                  **SUMMARY OF THE INVENTION**

23                  The main objective of the present invention is to provide a ball chair  
24                  with a retaining device that keeps a spherical cushion from separating from a

1 seat, whereby the ball chair is safe and steady.

2 Further benefits and advantages of the present invention will become  
3 apparent after a careful reading of the detailed description with appropriate  
4 reference to the accompanying drawings.

#### 5 BRIEF DESCRIPTION OF THE DRAWINGS

6 Fig. 1 is an exploded perspective view of a first embodiment of a ball  
7 chair with one type of retaining device in accordance with the present  
8 invention;

9 Fig. 2 is an exploded perspective view of a second embodiment of  
10 the ball chair with another type of retaining device in accordance with the  
11 present invention;

12 Fig. 3 is a perspective view of the ball chair in Fig. 2;

13 Fig. 4 is an operational side plan view of the ball chair with a  
14 backrest and a rod-shaped retaining device in Fig. 1; and

15 Fig. 5 is an operational side plane view of another embodiment of  
16 the ball chair with two rod-shaped retaining devices in Fig. 1.

#### 17 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

18 With reference to Fig. 1, a ball chair with a retaining device in  
19 accordance with the present invention comprises a seat (10), a spherical  
20 cushion (20), a front retaining piece, a rear retaining piece and an optional  
21 backrest (14).

22 The seat (10) has a seat frame (not numbered) with a top face (11), a  
23 bottom face (not numbered), a front edge (not numbered), a rear edge (not  
24 numbered), multiple legs (12) a dished passage (15), two optional front

1 connecting ears (16) and two optional rear connecting ears (17). The front  
2 and rear edges have two sides (not numbered). The multiple legs (12) are  
3 attached to the bottom face to support the seat frame, and each leg (12) has a  
4 distal end and a wheel (13) attached to the distal end so the ball chair be  
5 moved easily. The dished passage (15) extends from the top face (11) to the  
6 bottom face and has a larger diameter (not numbered) at the top face (11) and  
7 a smaller diameter (not numbered) at the bottom face. The two front  
8 connecting ears (16) are formed respectively on opposite sides of the front  
9 edge of the seat frame and respectively have through holes (162). The two  
10 rear connecting ears (17) are formed respectively on opposite sides of the  
11 rear edge of the seat frame and respectively have through holes (172).

12 The spherical cushion (20) is a resilient bladder and has a diameter  
13 slightly larger than the larger diameter of the passage (15). Thus the spherical  
14 cushion (20) rests on the seat frame such that a portion of the spherical  
15 cushion (20) protrudes through the passage (15).

16 Any of several types of retaining pieces are selectively attached to  
17 the seat frame to hold the spherical cushion (20) on the seat (10). The  
18 retaining pieces can be a rod or a backrest (14).

19 The front retaining piece is attached to the front edge of the seat  
20 frame and is a front retaining rod (30) made of rigid material such as plastic,  
21 metal, etc. The front retaining rod (30) has a contact rod (not numbered), two  
22 end pieces (not numbered) and two nuts (33). The contact rod is preferably  
23 curved and abuts the spherical ball (20) at or over the maximum diameter.

24 The two end pieces are parallel to each other and perpendicular to the contact

1 rod. Each end piece comprises a threaded end (31) and a flange (32) formed  
2 near the threaded end (31). The threaded ends (31) extend respectively  
3 through the through holes (162). The flanges (32) are formed respectively  
4 around the end pieces near the threaded ends (31) and abut respectively the  
5 front connecting ears (16). To secure the front retaining rod (30) to the front  
6 edge of the seat (10), the nut (33) is screwed onto the threaded end (31) to  
7 fasten the front retaining rod (30) on the seat (10).

8           The rear retaining piece may be a rear retaining rod (40) attached to  
9 the rear edge of the seat frame in the same manner as the front retaining rod  
10 (30). Thereby, the front and rear retaining rods (30, 40) hold the spherical  
11 cushion (20) in cooperation with the seat (10) to keep the spherical cushion  
12 (20) steady on the seat frame.

13           Selectively, the rear retaining rod (40) can be replaced by the  
14 backrest (14) that is detachably mounted at the rear edge of the seat frame,  
15 extends up from the rear edge of the seat frame to support a person's back  
16 and abuts the spherical cushion (20) above the maximum diameter. The  
17 spherical cushion (20) being held at the maximum diameter by the front  
18 retaining rod (30), above the maximum diameter by the backrest (14) and  
19 below the maximum diameter by the seat (10) keeps the spherical cushion  
20 (20) from falling off the seat (10), even when the ball chair vibrates.

21           With reference to Figs. 2 and 3, two retaining walls (50, 60) may be  
22 attached to the seat frame to replace the retaining rods (30, 40). Each  
23 retaining wall (50, 60) has a bottom edge (not numbered), a top edge (not  
24 numbered), two ends (not numbered), an inner periphery and two stubs (52).

1 The bottom edge is mounted on the top face (11) of the seat frame, and the  
2 top edge abuts the maximum diameter of the spherical cushion (20). The two  
3 stubs (52) are formed respectively at the two ends of the retaining wall (50)  
4 and engage the through holes (162) in the ears (16). The inner periphery of  
5 the retaining wall (50) is shaped to correspond to the spherical cushion (20).  
6 Thereby, the two retaining walls (50, 60) mounted on the seat frame enclose  
7 the spherical cushion (20) in cooperation with the seat (10).

8 With reference to Fig. 4, the spherical cushion (20) is deform and  
9 biased to the front edge of the seat (10) when a person sits on one  
10 embodiment of the ball chair. The retaining rod (30) and the optional  
11 backrest (14) stop the spherical cushion (20) from further deforming and  
12 keep the spherical cushion (20) from dislodging from the seat (10), which  
13 may otherwise cause the person to fall from the ball chair. Thus, the ball  
14 chair is safe and stable.

15 With reference to Fig. 5, the ball chair is used as an exercise device  
16 so a person can lie on the spherical cushion (20) and extend the spine. As an  
17 exercise device, the backrest (14) is detached and replaced with a rear  
18 retaining rod (40). Additionally, the two retaining walls (50, 60) can  
19 optionally replace the two retaining rods (30, 40).

20 Although the invention has been explained in relation to its preferred  
21 embodiment, it is to be understood that many other possible modifications  
22 and variations can be made without departing from the spirit and scope of the  
23 invention as hereinafter claimed.